

(19) World Intellectual Property
Organization
International Bureau



10/529409



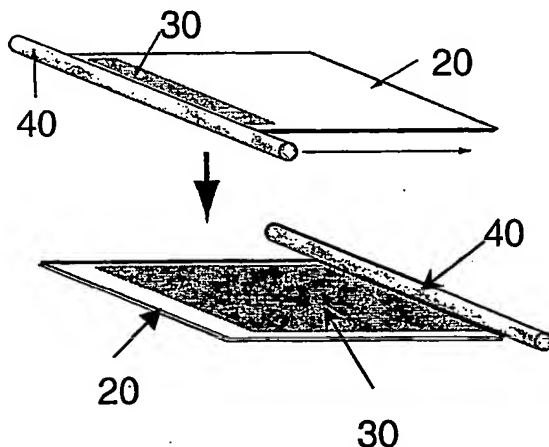
(43) International Publication Date
22 July 2004 (22.07.2004)

PCT

(10) International Publication Number
WO 2004/060531 A1

- (51) International Patent Classification⁷: B01D 29/00
- (21) International Application Number: PCT/US2003/031429
- (22) International Filing Date: 3 October 2003 (03.10.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/416,077 3 October 2002 (03.10.2002) US
- (71) Applicant (for all designated States except US): THE REGENTS OF THE UNIVERSITY OF COLORADO, A BODY CORPORATE [US/US]; 201 Regents Administrative Center, 3 Sys, Boulder, CO 80309 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): GIN, Douglas, L. [CA/US]; 708 Teal Circle, Longmont, CO 80503 (US). ZHOU, Meijuan [CN/US]; 1300 30th St., Apt. B4-33, Boulder, CO 80303 (US). NOBLE, Richard, D. [US/US]; 1262 Bear Mountain Court, Boulder, CO 80305 (US).
- (74) Agents: JONAS, Tamala et al.; GreenLee, Winner & Sullivan, P.C., 5370 Manhattan Circle, Suite 201, Boulder, CO 80303 (US).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: LYOTROPIC LIQUID CRYSTAL NANOFILTRATION MEMBRANES



(57) Abstract: The invention provides composite nanofiltration membranes (Fig. 5) with lyotropic liquid crystal (LLC) polymer porous membranes (30) attached to a porous support (20). The LLC membranes are prepared from LLC monomers which form the inverted hexagonal or bicontinuous cubic phase. The arrangement, size, and chemical properties of the pores can be tailored on the molecular level. The composite membrane of the invention is useful for separation processes involving aqueous and nonaqueous solutions as well as gases. Methods for making and using the composite nanofiltration membranes of the invention are also provided.

WO 2004/060531 A1